

Agriculture Canada

**Synthesis and Recommendations
Environmental Assessment of Crop Insurance**

Final Report

March 1994



Executive Summary

The Farm Income Protection Act of 1991 (FIPA) requires that a series of environmental assessments be undertaken of all programs enacted under it. The purpose of this project was to undertake the first environmental assessment of the federal-provincial Crop Insurance Program as required under the Act. The objective was to determine what environmental impacts could be attributed to the existence, structure and delivery of crop insurance in Canada. The context for the environmental assessment is to determine specifically the degree to which crop insurance affects farmers' production decisions and the net environmental impact of those decisions. This report presents the synthesis of the findings of the environmental assessment and the recommendations arising out of those findings.

The framework developed for the analysis explicitly recognized that a program, specifically crop insurance, affects the environment through the degree to which producers change practices in response to the program. The risk reduction offered by crop insurance or the practices required are the means through which decisions are affected. The choice of land, choice of crop, inputs used, and tillage or cultivation practices used are the factors which are affected and the areas which generate any environmental impacts.

Four components of analysis were undertaken to provide a multi-faceted approach to the assessment. The different levels and direction of analysis provide for a balanced assessment that offers multiple lines of evidence and complementary information as inputs into the assessment. The conclusions are built on a solid foundation and are supported by more than a single result or approach. The four components of analysis were:

- **Literature Review and Analysis**

This component provided a Canadian perspective on the environmental assessment of agricultural policy. It describes the nature of environmental assessments of policy and the essential components of such an assessments. It also outlines the economic theory and the theoretical impacts of policy on production decisions. The report provides a



comprehensive review of the empirical and qualitative literature on the impacts of agricultural policy on producer decisions and the impact on the environment of changing producer decisions.

- **Aggregate Data Analysis**

This component assessed data relating to crop insurance participation, acreage, and input use at an aggregate level. This analysis allows for inferences to be made regarding the role of crop insurance in any changes in producer decisions and practices. This analysis provides insight into such things as land use, diversification, input use, and cultural practices. By assessing the correlation between changes in crop insurance participation rates and changes in these individual factors it can be determined whether there is any likelihood that crop insurance is affecting the producer's decision making with respect to these factors.

- **Farm Level Decision Models**

This component involved the development of a number of "typical" Canadian farms to provide insight into the impact of crop insurance on the decisions of individual farmers at the micro level. The farm models were developed to reflect the characteristics in Canadian crop production through different regions, climates, soils, crops and cultural practices. The models explicitly incorporate risk such that the impact of crop insurance, which reduces the risk, on producer decisions can be modelled. Producer decisions affect such factors as land usage, crop selection, rotations and input use.

- **Qualitative Analysis**

This component has two primary elements. The first involved extensive consultations with a broad range of stakeholders to garner their perspectives on both the importance of environmental issues in agriculture and the role of crop insurance plays in affecting these issues. A request from the Minister of Agriculture for submissions was widely distributed and additional in-person interviews were conducted with many of the stakeholders. The



second element was a qualitative assessment of the structural differences in the various provincial crop insurance programs and the potential impact on the environment of those structural differences.

The four components were used to assess nine key issues as identified by the project team in conjunction with the steering committee. They are:

1. Does the risk reduction from crop insurance affect the crop mix selected?
2. Do crop insurance provisions encourage/discourage innovative land stewardship practices?
3. Does crop insurance affect input use in crop production?
4. Does crop insurance affect the nature of crop rotations?
5. Does crop insurance encourage production using marginal land?
6. Are the "good farming practices" provisions of crop insurance contracts affecting producer production decisions?
7. Does crop insurance affect the area and type of summerfallow used.
8. Does crop insurance affect the quantity and quality of wildlife habitat?
9. Does crop insurance encourage/discourage organic production?

Each issue was discussed individually in an issue profile. The issue was identified and explained, detailing the theoretical potential impact on producers and through them on the environment. The profiles then present the findings relating to the specific issue from the relevant components and conclude with a discussion of the specific environmental impact with respect to the issue in question.

The issues profiles indicated no significant environmental impacts that could be attributed specifically to crop insurance. However, there were some indications that there was no clear disincentive to undertake potentially harmful practices. There were also a number of potential problems areas identified in specific regions and crops. These issues explicitly addressed in the recommendations put forward for the crop insurance program.



The recommendations were:

Good Farming Practices

The identification of good farming practices provides the best lever for ensuring that crop insurance does not contribute to environmentally harmful practices. What constitutes "good farming practices" in terms of environmental sustainability must be clearly defined and formally incorporated into the field level operations of the crop insurance program in every province. This provides an opportunity to establish minimum acceptable guidelines for crop insurance at a national level.

Individual Coverage

Complete individual coverage should be adopted as soon as possible. This ensures that incentives for producers to undertake practices which will be harmful to the sustainability of their operation are removed. Individual coverage also provides an opportunity to allow producers to use different practices for sustainability and get coverage which accurately reflects the risk associated with that production. This allows for innovation with suitable coverage.

Organic Production

There should be attempts where possible to improve provisions for organic production.

Wildlife and Waterfowl Coverage

Coverage for wildlife and waterfowl damage should be improved.



Testing of New or Altered Provisions

All new provisions or significant alterations to the existing provisions of the crop insurance program should be tested for environmental soundness before being adopted. A two step process incorporating the approach used in this assessment would allow for a qualitative assessment of new provisions followed by quantification in any areas identified. This provides a proactive approach to ensuring that crop insurance does not contribute to environmentally harmful practices.

Requirements for Ongoing Monitoring

In order to streamline and improve the process of environmental assessment of programs, there is an opportunity to identify selected priority data or indicators to monitor changes and provide more detailed impact of programs on producer decisions. Indicators would provide greater information on actual environmental performance and producer practices.

Comprehensive Approach

We strongly urge the development of a framework for reviewing the environmental impact of agricultural policies in a comprehensive manner. While it is important to initially review each program in isolation to ensure that there are no negative environmental influences specifically attributable to that program, the comprehensive review is equally important to determine the total effect of programs on producer decisions and the interaction between programs.



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1.0 Introduction

1.1 Introduction

The Farm Income Protection Act of 1991 (FIPA) requires that a series of environmental assessments be undertaken of all programs enacted under it. The first is to take place within two years of the introduction of the program (or of the passage of the Act for programs preceding FIPA) and subsequent ones every five years. The aim of the reviews is to ensure that the environment is protected and that environmentally sustainable practices are used in agricultural production. FIPA provides for the withholding, restricting or changing of insurance in order to ensure this aim is achieved. The specific provisions under FIPA regarding the environmental assessments are:

- 5(2)(a) provide for the circumstances and conditions under which insurance may be withheld, restricted or enhanced for the purpose of protecting the environment and of encouraging sound management practices to ensure environmental sustainability; and
- 5(2)(b) require an environmental assessment of the program to be conducted within two years after coming into force of the agreement and every five years thereafter, and provide for the manner in which the assessment is to be conducted.

The purpose of this project was to undertake the first environmental assessment of the federal-provincial Crop Insurance Program as required under the Act. The objective was to determine what environmental impacts could be attributed to the existence, structure, or delivery of crop insurance. This report presents a synthesis of the findings of the environmental assessment and the recommendations arising out of those findings. The remainder of this chapter briefly outlines the framework and approach used to undertake the environmental assessment of crop insurance. Chapter Two provides the findings of the environmental assessment. Chapter Three discusses crop insurance's role in the broader policy context. The final chapter outlines key recommendations arising from the findings.



1.2 Environmental Assessment of Crop Insurance

The federal-provincial Crop Insurance Program has protected Canadian farmers against yield losses caused by natural hazards for more than twenty years. Producers can purchase insurance protection to guarantee a minimum yield and hence revenue for crops they grow.¹ Crop Insurance is a tripartite program with producers paying 50% of the premium, and the federal and provincial governments paying 25% each². The costs of administering the delivery of the crop insurance program through provincial agencies is shared equally by the federal and provincial governments.

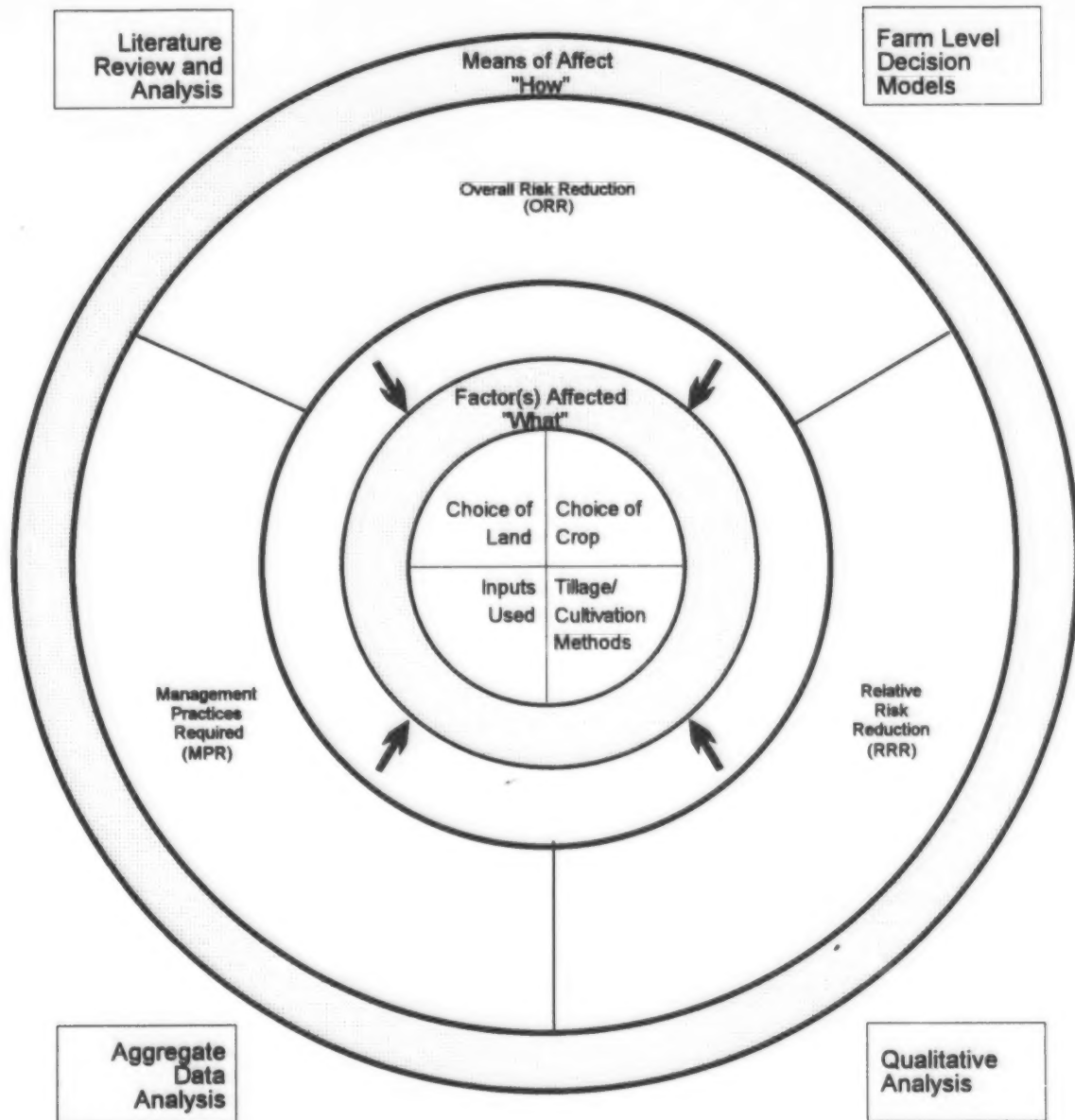
It is essential to establish the context in which this environmental assessment took place. It has long been recognized that agriculture leaves a footprint. That is, the very existence and practice of agriculture disturbs the natural environment. Government policies for agriculture, regardless of whether they are regulatory or support in nature, affect the farmer's decision process. A program such as crop insurance does not directly affect the environment. What it affects is the producer's decisions about production, which in turn affect the environment. The degree to which those production decisions either alleviate or exacerbate the overall environmental impact of agriculture is the specific impact of an individual policy or program. **The context for this study is to determine specifically the degree to which crop insurance affects farmers' production decisions and the net environmental impact of those decisions.** This assessment assumes as a benchmark that all other agricultural programs would have continued to exist in the absence of the crop insurance program and accordingly attempts to isolate the effects distinctly resulting from crop insurance.

¹ A detailed discussion of the structure of the crop insurance programs in each province can be found in the Analysis of Aggregate Data, one of the four component reports which serve as technical appendices to this summary report.

² In Newfoundland the provincial government provides 35% of the premium with producer contribution at 40%



Exhibit 1.1
Environmental Impact of Crop Insurance
Framework for Analysis



1.3 Analytical Framework

There are two dimensions to the assessment of the environmental impact of crop insurance: First, by what means or **how** the crop insurance program affect producers' decisions, and second which factors of production or **what** is affected. This is shown in Exhibit 1.1, the Framework for Analysis. The two dimensions of "How" and "What" are represented by the shaded rings of the diagram.

The three sections immediately inside the outer ring of the diagram represent the three means by which producers decisions can be affected. They are:

- **Overall Risk Reduction (ORR):** by changes to the overall production and income risk borne by the producer. This risk reduction could be referred to as that which results because the crop insurance program **"exists"**.
- **Relative Risk Reduction (RRR):** by changes in the relative risk between elements such as crops, land, producers, level of coverage, etc. This risk reduction could be referred to as that which results from the **"form"** the program takes.
- **Management Practices Required (MPR):** by requiring specific management practices be used in order to be eligible for coverage under the program. This could also be referred to as the **"compliance"** requirements of the program.

The four quadrants in the centre of the diagram represents the four factors of production that can be affected by the crop insurance program. They are:

Choice of Land: Which land is farmed and how much land is farmed?

Choice of Crop: Which crop is selected for production? How are rotations chosen?



Inputs Used: Which inputs (fertilizer and chemical) are used and how much is used?

Tillage/Cultivation Used: What form and extent of tillage or cultivation is used?

1.4 Four Components of Analysis

The four boxes in the corners of Exhibit 1.1 indicate the four methods of analysis that are used to determine both **how** the crop insurance program affects producers' decisions and **what** is affected (including the extent of the affect). The four components of analysis are:

- **Literature Review and Analysis**

This component provided a Canadian perspective on the environmental assessment of agricultural policy. It describes the nature of environmental assessments of policy and the essential components of such an assessments. It also outlines the economic theory and the theoretical impacts of policy on production decisions. The report provides a comprehensive review of the empirical and qualitative literature on the impacts of agricultural policy on producer decisions and the impact of the environment of changing producer decisions.

- **Aggregate Data Analysis**

This component assessed data relating to crop insurance participation, acreage, and input use at an aggregate level. This analysis allows for inferences to be made regarding the role of crop insurance in any changes in producer decisions and practices. This analysis provides insight into such things as land use, diversification, input use, and cultural practices. By assessing the correlation between changes in crop insurance participation rates and changes in these individual factors it can be determined whether there is any likelihood that crop insurance is affecting the producer's decision making with respect to these factors.



- **Farm Level Decision Models**

This component involved the development of a number of "typical" Canadian farms to provide insight into the impact of crop insurance on the decisions of individual farmers at the micro level. The farm models were developed to reflect the characteristics in Canadian crop production through different regions, climates, soils, crops and cultural practices. The models explicitly incorporate risk such that the impact of crop insurance, which reduces the risk, on producer decisions can be modelled. Producer decisions affect such factors as land usage, crop selection, rotations and input use.

- **Qualitative Analysis**

This component has two primary elements. The first involved extensive consultations with a broad range of stakeholders to garner their perspectives on both the importance of environmental issues in agriculture and the role of crop insurance plays in affecting these issues. A request from the Minister of Agriculture for submissions was widely distributed and additional in person interviews were conducted with many of the stakeholders. The second element was a qualitative assessment of the structural differences in the various provincial crop insurance programs and the potential impact on the environment of those structural differences.

The four components provide four distinct approaches to assessing the nature and degree of influence of crop insurance on the producers' decisions and subsequently an assessment of the environmental consequences of that influence. This multi-faceted approach to the assessment ensures a balanced assessment which does not depend on an individual approach or input.

The conclusions are built on a solid foundation and are supported by more than a single result. A separate detailed report on each component of the analysis was completed and serve as technical appendices to this summary report.



Exhibit 1.2
Classification of Issues

Factor(s) Affected (What) Means of Affect (How)	Choice of Land	Choice of Crop	Inputs Used	Tillage/ Cultivation Methods
Overall Risk Reduction	1, 5, 8	1, 4, 9	3, 7, 9	2, 7
Relative Risk Reduction	1, 5, 8	1, 4, 9	3, 7, 9	2, 7
Management Practices Required	6, 8	4, 6, 9	3, 6, 7, 9	2, 6, 7

1.5 Environmental Issues

The analysis framework is used to assess specific issues with respect to the potential influence of the crop insurance program on producers' decisions.

Nine key issues were identified by the project team in conjunction with the steering committee and other technical experts. They are:

1. Does the risk reduction from crop insurance affect the crop mix selected?
2. Do crop insurance provisions encourage/discourage innovative land stewardship practices?
3. Does crop insurance affect input use in crop production?
4. Does crop insurance affect the nature of crop rotations?
5. Does crop insurance encourage production using marginal land?
6. Are the "good farming practices" provisions of crop insurance contracts affecting producer production decisions?
7. Does crop insurance affect the area and type of summerfallow used.
8. Does crop insurance affect the quantity and quality of wildlife habitat?
9. Does crop insurance encourage/discourage organic production?

The results of the analysis of each issue is presented in the issues profiles in the chapter which follows. The profiles contain some specific examples of potential interaction between crop insurance and the environment through producer management/production decisions.

Exhibit 1.2 shows how each issue profile fits into the analytical framework. For example, issue 5, **"Does crop insurance encourage production using marginal land"** is shown in the box which intersects overall risk reduction and choice of land and relative risk reduction and choice of land. This indicates that the decision to cultivate marginal land is affected by the amount of overall risk



reduction and relative risk reduction that crop insurance provides. The four components of analysis test (1) if there is overall risk reduction, (2) if there is relative risk reduction, and (3) if either affects producers choice of land, specifically their decision to use marginal land.

A second example is issue 7, **"Does crop insurance affect the area and type of summerfallow used."** In this case a 7 is shown in the six boxes intersecting overall risk reduction, relative risk reduction, and management practices required (down the left) with Inputs Used and Tillage/Cultivation Methods (along the top). The analysis would, therefore, test whether the overall risk reduction, relative risk reduction and management practices required under crop insurance affect producers' decision to use chemical or mechanical fallow and how much land to fallow.

Following this format, the remainder of the issues are classified in the matrix.



2.0 Issues Profiles

In this chapter profiles of the nine environmental issues are presented. Each profile provides an explanation of the nature of the issue and a description of the theoretical impact that crop insurance could have on this issue. In the findings section the results of the analysis of this issue under each of the four components: qualitative analysis, farm level decision models, aggregate data analysis and literature review and analysis are provided.

The environmental impacts of crop insurance with respect to the issue is then provided in conclusion. More detail on the analysis provided by each component is found in the four component reports which serve as technical appendices to this report.



2.1 Crop Selection

Issue:

Does the risk reduction from crop insurance affect the crop mix selected?

Explanation:

The level of or nature of coverage generally or between crops could affect the degree of diversification or nature of crop mix. Although levels of protection or coverage may be the same the actual relative level of risk reduction may vary.

Theoretical Impact:

Producers:

Yield insurance may reduce the incentive for diversification to combat risk which could lead to more specialized and perhaps larger farms.

If the relative risk reduction is higher for one crop than another, the producer may have an incentive to produce more of that crop.

Environment:

The degree of diversification and the type of crops selected can have either positive or negative environmental affects depending on the crop portfolio resulting. Some crops provide a greater degree of soil rehabilitation than others.

Findings:

Qualitative Analysis:

- Cropping decisions are based on a broad number of factors including market conditions and other programs which overwhelm the crop insurance effects.
 - The risk reduction offered by crop insurance may reduce the incentive to spread risk over a wider range of crops
-



- The forage insurance program is not perceived to be as effective as that provided for other crops
- Timely insurance of new crops helps encourage diversification. This is not always perceived to be the case.
- It is important to recognize that coverage levels alone are not an appropriate indicator of the variance in level of support provided. It is the probability of receiving a payment that is key to producers' perception of the benefit provided. Some crops are more risky than others and, therefore, similar coverage levels offer greater risk reduction.

Farm Level Decision Models:

The farm level decision models can provide insight into relative risk reduction between crops and therefore biases created by crop insurance.

- Indicated no clear advantage to one crop over another in:
 - Southern Alberta Grain;
 - Alberta Livestock;
 - Saskatchewan Dark Brown Soil Zone Grain Model; and
 - Quebec Forage Model.
- Indicated some relative advantages as follows:
 - Saskatchewan Grey/Black Soil Zone Grain Model: canola benefits less and incentive to grow alfalfa increased relative to other crops;
 - Southern Manitoba Grain Model: hard red spring wheat, canola, and flax have a larger risk reduction relative to barley;
 - Ontario Grain Model: winter wheat garners most benefits from risk reduction and soybeans show more relative incentives than does corn (but difference is small);
 - Ontario Tomato Model: winter wheat garners the most benefit from risk reduction and soybeans show more relative incentive than does corn;
 - New Brunswick Potato Model: potatoes have a greater degree of risk reduction relative to other crops, and oats and hay are less attractive relative to potatoes;
 - Prince Edward Island Potato Model does not seem to favour one potato variety over another and improves hay relative to barley but makes it less attractive relative to potatoes;
 - British Columbia Apple Model: risk reduction afforded red delicious apples exceeds Macintosh.

Aggregate Data Analysis:

- In Ontario there is some indication that there may be correlation between soybean acreage and crop insurance participation but no correlation for any other crops.



- In Saskatchewan there is some indication that there may be a correlation between wheat, canola, lentils and field pea acreage and crop insurance participation.
- In Alberta there is some indication that there may be a correlation between canola acreage and crop insurance participation but no correlation for other crops
- Differences in participation among crops do not reflect differences in the coefficients of yield variation. The coefficients range between 12% and 14.9% in Ontario, 18.7% and 19.8% in Manitoba, and 11.5% and 12.9% in Alberta. In Saskatchewan however, higher variability in spring wheat relative to barley and canola is reflected in participation.
- The level of participation in most cases indicates that producers do not see an extremely high overall benefit from crop insurance indicating it is less likely to have an affect on their decisions (PEI below 53%, Nova Scotia peaked at 30%, Quebec ranges from 75% for corn to 55% for barely, Ontario below 65%, Manitoba 70%). There are some exceptions. New Brunswick participation is 93%, Saskatchewan is 80%, Alberta and B.C. are at 75%.
- The portion crop insurance represents of total benefits received by producers is relatively low. It is 10% in PEI, 5% in Nova Scotia, 7% in New Brunswick, 4.3% to 18.5% depending on crop in Quebec, 4.2% in Ontario, 3.2% to 16.5% in Manitoba, .1% to 26.3% in Saskatchewan, 7.7% to 28.2% in Alberta, .8% and 13% of total net benefits in B.C. for 1989 and 1990 respectively.
- Virtually no participation response was found after a bad crop year suggesting producers do not look to crop insurance as the primary answer to risk. Exceptions are winter wheat and grain corn in Ontario and field peas, lentils, wheat, canola in Saskatchewan.

Literature Review:

- Kramer and Pope (1982) used a representative Virginia farm simulation model 1964 to 1980 to compare farm income with and without crop insurance. Their results suggest that the purchase of crop insurance does not seem to have a major impact on the financial performance of the farm.
- Turvey (1992) used stochastic dominance and an expected utility maximization model to compare the effects of price insurance, gross revenue insurance and crop insurance on the production decisions of a representative cash crop farm in Ontario. Crop insurance seemed to have a small effect on the crop mix decisions. The overall results suggest that the reduction in risk that the producer gains from crop insurance is small and unlikely therefore to have a major impact on production decisions
- The results above were consistent with findings of Patrick and Rao who conclude that crop insurance has only a small effect on farm viability for farms in Indiana.



- Weisensel *et al* (1990) used on farm interviews of 243 Saskatchewan farmers to study the effects of crop insurance on the behaviour of farmers. According to these farmers responses, crop insurance has had only a minor impact on production decisions. The reliability of such data is questionable however because of the potential for producers to be protective of crop insurance and to be overly positive about their environmental practices because of the recent focus in this area. It is also difficult to isolate crop insurance only affected decisions.
- von Massow and Weersink used time series data to estimate acreage response functions for Ontario crops. Their results indicated that white bean acreage would fall by 4.6 percent, corn acreage would not change, soybean and winter wheat area would fall by .4 percent and .04 percent respectively if crop insurance were not available.

Environmental Impacts:

It is not clear that there is any significant impact on the environment, either positive or negative, arising from changes in crop selection or diversification due to crop insurance. There were some indications that potatoes were favoured over the other crops in the rotation in the Maritime. There was also some evidence that grains and other annual crops were favoured over forages in the prairie provinces, largely because of the area coverage for forages. These impacts would be negative environmentally but are considered to be small.

These effects could be addressed by:

- In the case of potatoes, a clearly defined and enforced rotational pattern could be incorporated into the good farming practice provisions to ensure that the relative advantage received by potatoes does not shorten those rotations.
- In the case of forages, an improved system of coverage that provides equitable levels of coverage and the perception of equitable levels of coverage (many stakeholders indicated that the area approach to forage insurance did not provide the same measure of coverage as individually based coverages for other crops) would help to remove this bias.



2.2 Land Stewardship Practices

Issue:

Do crop insurance provisions encourage/discourage innovative land stewardship practices?

Explanation:

Any program which provides producers protection from market or yield risk may provide the degree of security necessary to allow the investment in non revenue enhancing practices which are environmentally sound.

The protection available under crop insurance could, either alone or in concert with other programs, encourage or discourage innovative land stewardship programs. For example:

- PFRA's Permanent Cover Program may be more appealing if the forage produced through the program is insurable.
 - The disaster insurance provided through crop insurance may improve uptake of programs to encourage terracing in potato fields.
 - The buffering of yields both up and down may slow the implementation of strip or contour cropping on land subject to erosion.
-

Theoretical Impact:

Producers:

The provision of crop insurance programs could play a role in the producer's decision to implement innovative land stewardship practices.

Producers who have reduced risk will have the security and stability to invest time and money into:

- shelterbelts to reduce wind erosion;
 - measures to control soil erosion; and
 - winter cover crops to reduce water erosion.
-



Environment:

The implementation of new and innovative land stewardship practices can lead to a reduction in soil degradation which reduces both the on and off farm impacts of erosion.

- on the farm where positive soil management and soil preservation enhance the sustainability of agricultural production on individual producing units; and
- off farm where wind and water borne soil can cause problems.

Findings:

Qualitative Analysis:

- Many stakeholders felt that there should be increased monitoring of cultural practices. Currently this is only happening in claim situations.
- It is important to be sensitive to regional differences when defining good and bad environmental practices.
- Many of the stakeholders consulted felt that the security offered by crop insurance allows producers to try new practices.
- Unseeded acreage and unharvested acreage provisions are positive in that they discourage unnecessary field passes.
- An incentive system may be the best way to further encourage the adoption of new environmentally sound practices.

Environmental Impacts:

The security provided by crop insurance was generally felt to have a positive impact on the adoption of innovative land stewardship practices. The incorporation of new land stewardship practices into the group of acceptable practices and the exclusion of poor practices from what is considered good farming practice sets reasonable parameters for producers. It is important that these be effectively defined and kept current. The incorporation of new and environmentally positive production practices into the defined good farming practices is essential to ensure that producers are at minimum not discouraged from using them. Similarly, the exclusion of poor or environmentally dangerous practices should also be completed on a timely basis as more information and alternate approaches are available.



2.3 Input Use

Issue:

Does crop insurance affect input use in crop production?

Explanation:

The intensity of input use and the mix of inputs used is reflected in the quantity and quality of crops harvested. The parameters of the crop insurance program may influence a producer's decision on input intensity and use.

Theoretical Impact:

Producers:

Crop insurance, through reduced risk or expected yield calculation, may influence producers' decisions on input mix and intensity. Crop insurance is a risk reducing input as are pesticides when used at the recommended levels. Fertilizer, on the other hand, is risk increasing as it increases the range of potential yields as well as costs. There may be tradeoffs in the use of different risk increasing and decreasing inputs.

Environment:

The intensity and mix of input use can have both on farm and off farm effects. The degree of chemical residues and fertilizer leaching depends on volumes used. Alternately, while decreased use of fertilizer may reduce leaching, underfertilization can reduce the long term productivity of the soil resource.

Findings:

Qualitative Analysis:

- Economic and other policy factors overwhelm the influence of crop insurance.
 - Security from natural hazards may provide an incentive to use the appropriate levels of inputs. However, in the short term there may be an incentive to reduce input use. In the longer term, expected yields would begin to reflect these differences.
-



Farm Level Decision Models:

- All eleven farm level models found no significant impact on input use from the introduction of crop insurance

Aggregate Data Analysis:

Fertilizer Use:

- In the Atlantic provinces there was a significant correlation between crop insurance participation and increased fertilizer use.
- There was a moderate correlation in Quebec between crop insurance participation and fertilizer use.
- There was a moderate negative correlation in Ontario between crop insurance participation and fertilizer use.
- There was no correlation between crop insurance participation and fertilizer use in the provinces of Manitoba, Saskatchewan, Alberta and B.C.

Pesticide Use:

- There was no correlation between crop insurance participation and pesticide use in the Atlantic provinces, Quebec, Manitoba, and British Columbia.
- There was a weak negative correlation between crop insurance participation and pesticide use in Ontario.
- There was a moderate positive correlation between crop insurance participation and pesticide use in Saskatchewan and Alberta.

Literature Review:

- Anderson (1992) showed through simple linear regression that 65 percent of the variation in fertilizer use internationally can be explained by differences in the overall level of subsidization. While this may be suggestive, the mechanism used for subsidization is important in determining impact.
- Fulton *et al* (1989) concluded that crop insurance leads to an expansion of production and increased total input use. This analysis is qualitative however and no magnitude of impact indicated.



- Weisensel *et al* (1990) used on farm interviews of 243 Saskatchewan farmers to study the effects of crop insurance on the behaviour of farmers. According to these farmers responses, crop insurance has had only a minor impact on production decisions. The reliability of such data is questionable however because of the potential for producers to be protective of crop insurance and to be overly positive about their environmental practices because of the recent focus in this area. It is also difficult to isolate crop insurance only affected decisions.
- Feinerman *et al* (1992) explored the linkage between the use of pesticides and crop insurance. He used a representative farm risk programming model for an Iowa farm. The results indicated a modest reduction in insecticide use when crop insurance is made available to farmers.

Environmental Impact:

There is no evidence that crop insurance either negatively or positively affects input use. There were no clear significant changes in the level of pesticides used due to crop insurance provisions or participation. Crop insurance seems to play a small part in the overall decision making process. Market factors, financial status and other programs seem to be a greater influence on the production decision making process. There may be a short term reduction in input use due to financial hardship and the protection offered by crop insurance against yield losses. The increasing use of individual coverages and the effect of claims on coverage levels will affect the degree to which reduced input use is possible and sustainable.

The definition of good farming practices will affect the degree to which producers are able to decrease input use. Great care must be taken in establishing reasonable minimum and maximum levels of input use which are deemed acceptable. The practices of individual producers have to be monitored to establish a reasonable set of parameters for the individual and allow choice in determining input levels. If producers can demonstrate that with cultural practices and other factors they can reduce input use and maintain an economically viable yield level, they should be allowed that coverage. This may require additional monitoring as checks will have to be done in non claim years to establish a benchmark and to ensure that practices in those non claim years are not detrimental.



2.4 Crop Rotations

Issue:

Does crop insurance affect the nature of crop rotations?

Explanation:

Crop insurance may have implications for crop selection in a given year, as discussed in an earlier profile. This issue addresses its affect on the nature of rotations over a period of years. The relative and absolute risk reduction provided by crop insurance could affect the frequency and composition of rotations. For example, potato rotations have shortened due to a variety of factors including: financial stress, limited land availability, and relative prices. Grains and forages are in a potato rotation, in part to allow for an increase in organic matter and a reduction in disease risk.

Theoretical Impact:

Producer:

The reduced yield and disease risk given by crop insurance may contribute to the change in the nature and frequency of the rotations.

Environment:

A shorter/more frequent potato rotation reduces soil organic matter and potentially increases the opportunity for soil erosion reducing long run soil fertility and causing increased silt in surface waterways.

Findings:

Qualitative Assessment:

- Cropping decision are based on a broad number of factors which overwhelm crop insurance.

Farm Level Decision Models:

- The New Brunswick Potato Model indicates there may be some incentive to shorten the potato rotation.
-



- In the prairie provinces there may be some incentive to reduce the amount of summerfallow as stubble crops seem to have a higher level of coverage under crop insurance.

Aggregate Data Analysis:

- Summerfallow acres have generally decreased over the same time period that crop insurance participation has increased. There is not sufficient data to establish a formal correlation although they do not appear to be directly correlated.

Literature Review:

- Weisensel *et al* (1990) used on farm interviews of 243 Saskatchewan farmers to study the effects of crop insurance on the behaviour of farmers. According to these farmers responses, crop insurance has had only a minor impact on production decisions. The reliability of such data is questionable however because of the potential for producers to be protective of crop insurance and to be overly positive about their environmental practices because of the recent focus in this area. It is also difficult to isolate crop insurance only affected decisions.
- Gardner and Kramer (1986) used historical time series data to assess the response to free U.S. crop insurance. They concluded that results were: expansion of cultivated acreage on to more risky land, increased use of summerfallow, increased degree of specialization and decreased use of cover crops.

Environmental Impact:

The environmental impact on potato land has the potential to be negative. There is a definite relative advantage to insuring potatoes that puts pressure on shortening the rotation. This is exacerbated by recent market conditions. Potatoes leave the soil more subject to erosion than do the other crops in the rotation. Potatoes also required increased levels of input and are generally harder on the soil than are the other crops in the rotation. Finally, the forages and grains used in a potato rotation return a greater volume of organic matter to the soil than do potatoes. The length of a proper potato rotation should be clearly defined in the good farming practices and these provisions must be enforced. Verification needs to occur in non claim years as well as claim years to ensure that good farming practices are followed and rotations are not unduly shortened.

The environmental impact in the prairie provinces has the potential to be positive. Despite different coverages for stubble and fallow land, the greater variability of yields on stubble land seems to provide a greater level of crop insurance yield protection for crops on stubble land. It is, however, not clear that the differences in coverage levels are sufficient to dramatically affect summerfallow acreages.



2.5 Marginal Land

Issue:

Does crop insurance encourage production using marginal land.

Explanation:

As risk is reduced, in addition to an incentive to specialize, there may be an incentive to produce more crops. As most producers are limited by holdings and the availability of good quality rental land at reasonable prices, the incentive may be to expand production onto marginal lands.

Theoretical Impact:

Producers:

As overall risk is reduced, there may be an incentive to increase land use. This could potentially bring more marginal land into production. The risk reduction offered by crop insurance may also discourage the removal of marginal land from production.

Environment:

Marginal land can be more environmentally fragile and require increased input intensity to generate acceptable yields.

Findings:

Qualitative Assessment:

- Economic and other policy factors overwhelm the influence of crop insurance on producers' decisions.
 - The move toward individually based coverage limits the incentive for production on marginal lands.
 - There is some suggestion that a higher level of risk should be incorporated into premiums or coverage for environmentally sensitive land.
 - Farm splitting if allowed could result in increased use of marginal land.
-



Farm Level Decision Models:

- There was no incentive to change the total amount of land under cultivation/production in any of the eleven farm models.

Aggregate Data Analysis:

- No apparent correlation between total land use and crop insurance in P.E.I., N.S., N.B., Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and B.C.
- Trends in "other land" (that land not in crops, summerfallow or pasture) in the prairie provinces are reversing or stopping. After earlier decreases in other land during the 1970's, there has been some rebounding in Alberta and Saskatchewan has been flat through the 1980's.

Literature Review:

- Bond *et al.* (1980) indicated that programs which reduce the farmer's cost of risk bearing, such as crop insurance have mixed effects on land use. Crop insurance however was viewed as being consistent with Federal Policy on Land Use as compared to the Western Grain Stabilization Act and Agricultural Stabilization Board which were not. No explanation is given as to why the difference exists and the assessment was purely qualitative.
- Fulton *et al.* (1989) concluded that crop insurance leads to an expansion of production and increased total input use. This analysis is qualitative and no magnitude is indicated.
- Weisensel *et al.* (1990) used on farm interviews of 243 Saskatchewan farmers to study the effects of crop insurance on the behaviour of farmers. According to these farmers responses, crop insurance has had only a minor impact on production decisions. The reliability of such data is questionable however because of the potential for producers to be protective of crop insurance and to be overly positive about their environmental practices because of recent focus in this area. It is also difficult to isolate crop insurance only affected decisions.
- Gardner and Kramer (1986) used historical time series data to assess the response to free U.S. crop insurance. They concluded that results were: expansion of cultivated acreage on to more risky land, increased use of summerfallow, increased degree of specialization and decreased use of cover crops.
- Pasour (1990) reached similar conclusions about the effect of crop insurance on expansions of cultivated acres.



Environmental Impact:

The qualitative assessments have suggested that acreage increases with the introduction of crop insurance. This suggests that crop insurance is bringing environmentally sensitive or marginal land into production. There is, however, no quantitative evidence that marginal land is being brought into production due to crop insurance. The cumulative effect of market conditions, government programs and other factors provides the incentive to produce using marginal land. While there is no evidence that crop insurance alone contributes to production on marginal land, provisions should be made to exclude coverage of newly broken land if it is considered fragile or habitat. This would ensure that even a marginal contribution of incentive to break new land is removed.



2.6 Good Farming Practices

Issue:

Are the "good farming practices" provisions of crop insurance contracts affecting production decisions.

Explanation:

The degree to which these provisions are formally defined and enforced may affect a producer's ability to adopt new or different production management practices. The inclusion of various practices as acceptable/unacceptable could potentially affect use of those practices.

Theoretical Impact:

Producers:

The definition and enforcement of "good farming practices" can prevent/encourage a producer to undertake specific practices to ensure total coverage. Using unacceptable practices, from a crop insurance perspective, may reduce the degree to which crop loss is attributable to insurance perils.

Environment:

The nature of any environmental impact depends specifically on the nature of any change in producer management decisions. For example:

- Rules on coverage for organic production may affect the decision to produce organically. This can have both positive and negative environmental impacts.
 - Rules on zero or low till production could affect the adoption of that practice.
-

Findings:

Qualitative Assessment:

- Enforcement varies and is generally not considered to be as strong as it could be. Checks of good farming practices are usually only conducted in claim situations.
-



- There are some problems with the definition of what is environmentally sound. There are regional variations and tradeoffs between environmental objectives. These must be clearly identified in order to provide formal parameters on what is acceptable.
 - There is some tendency to require practices which will limit probability of payment rather than be the most environmentally sensitive. Good farming practices need to be established to identify what is environmentally acceptable.
 - Acceptance of more environmentally friendly practices varies from province to province.
-

Environmental Impact:

The definition of good farming practices provides generally accepted parameters within which a farmer is expected to remain. There is a possibility that in some cases poor environmental practices are allowed.

- The definition of good farming practices excludes practices for which yields may be expected to fall rather than specifically environmentally sound practices.
- Enforcement is not as strong as possible because verification of good farming practices is normally only undertaken in claim cases.

The good farming practices provisions are a good opportunity to establish "acceptable" environmental practices which are required for eligibility for crop insurance. This is the most powerful tool in ensuring that crop insurance does not provide the incentive or the opportunity to undertake any potentially environmentally unsound practices. It also provides an opportunity for some basic national standards of practice that would ensure a minimum level of sustainability for producers using crop insurance. The success of the good farming practices provisions, however, depends on regular and uniform monitoring of performance in claim and non claim years.



2.7 Summerfallow

Issue:

Does crop insurance affect the area and type of summerfallow used?

Explanation:

Crop insurance programs may or may not offer different yield coverage for summerfallow and stubble seeded groups. These differences in relative coverage may increase or decrease the frequency with which land is fallowed. The type of fallow used, either cultivated or chemical fallow, may also be affected if the relative risk and relative risk reduction differs.

Theoretical Impact:

Producers:

A producer who faces relative risk reduction not consistent with the true relative risk may change production management practices to reflect this bias.

Environment:

The amount and type of fallow used can have environmental impacts. Fallow is used to preserve soil moisture for sustainable production but is more susceptible to wind erosion. Chemical fallow is less susceptible to wind erosion than cultivated fallow but requires higher rates of pesticide use.

Findings:

Qualitative Assessment:

- There is a perception among some stakeholders that since the absolute level of coverage, that is, the calculated level of expected yield, is higher for fallow crops than for stubble, there may be an incentive to increase fallow. However, the reality of continuous cropping or less frequent fallowing allows for more crops and thus coverage on stubble land may already be encouraging reduced summerfallow.

Farm Level Decision Models:

- In the southern Alberta Grain Model, stubble grown crops have a higher degree of risk reduction than fallow grown crops.
-



- In the Alberta Livestock Enterprise Forage Model, stubble crops have highest level of risk reduction.
- In the Saskatchewan Dark Brown Soil Zone Grain Model there was no bias between crops planted into either stubble or summerfallow.
- In the Saskatchewan Grey/Black Soil Zone Grain Model, stubble seeded crops were generally given a greater measure of risk reduction.

Aggregate Data Analysis:

- There was no apparent correlation between total land use and crop insurance.
- In Manitoba, Saskatchewan and Alberta, half of the increase in cropped acres can be attributed to decreases in the amount of land summerfallowed.

Literature Review:

- Gardner and Kramer (1986) used historical time series data to assess the response to free U.S. crop insurance. They concluded that results were: expansion of cultivated acreage on to more risky land, increased use of summerfallow, increased degree of specialization and decreased use of cover crops.

Environmental Impact:

There seem to be conflicting results. While some previous studies in the United States have suggested that summerfallow acreage increases with crop insurance, there appears to be higher real coverage levels for stubble grown crops in Canada. This is due to the increased variability of yields on stubble seeded crops versus fallow seeded. The overall impact of crop insurance, either positive or negative, is considered to be small in the Canadian case. The real incentive for the individual producer will depend on whether they perceive the higher expected yields on fallow seeded crops to be an advantage for fallow or not. This could well differ between producers.

The incorporation of chemical fallow into the accepted practices for insurance means that less fallowed land is subject to erosion.

There have been some suggestions that, in some areas, expected yields on stubble seeded crops should be equal to those on fallow seeded crops. The actual yields in some regions are very close given current practices and information. The ongoing focus on individually based coverages will allow crop insurance to reflect those differences for individuals. This will help to ensure that no incentive is provided to increased summerfallow.



2.8 Wildlife Habitat

Issue:

Does crop insurance affect the quantity and quality of wildlife habitat available?

Explanation:

Marginal lands often provide wetlands, grasslands or woodlands habitat for wildlife. Crop insurance may specifically affect habitat if there is an incentive to bring this land into production.

Theoretical Impact:

Producer:

As overall risk is reduced, there may be an incentive to increase land use. This could potentially bring more marginal land into production. The risk reduction offered by crop insurance may also discourage the removal of marginal land from production.

Environment:

Habitat loss increases the pressure on wildlife populations. Individual habitats can only sustain a given population and thus decreased habitat reduces populations. In some cases, where unique habitat is reduced to extremely low levels, species are threatened.

Findings:

Qualitative Assessment:

- In addition to the comments on marginal lands, stakeholders felt that increasing wildlife damage coverage would reduce stimulus to remove habitats. While there may not be an incentive to remove habitat due to crop insurance there may be an argument to increase coverage so that incentive to remove habitat to reduce risk of damage is reduced.

Farm Level Decision Models:

- The fact that there are no incentives to increase inputs or the use of marginal land, suggests that crop insurance has a very limited affect on wildlife habitat.
-



Environmental Impacts:

There is no evidence that crop insurance provides an incentive to bring wildlife habitat into production. There may be an argument for increasing the coverage of loss due to wildlife damage but it is unclear that this will have a dramatic effect. The removal of a single slough for waterfowl, for example, does not preclude waterfowl damage as neighboring lands may still have wetlands.

The exclusion of cultivated habitat from insurance, as was suggested with marginal land generally, may provide an opportunity to ensure that no incentive exists due to crop insurance for the removal of habitat. In fact, this could incorporate an explicit disincentive to offset other factors.



2.9 Organic Production

Issue:

Does crop insurance encourage/discourage organic production.

Explanation:

The level and nature of coverage for organic crops relative to conventionally produced crops could affect the incentive to produce organically.

Theoretical Impact:

Producers:

The lack of specifically focused organic yield insurance may reduce the incentive to produce organically.

Environment:

Organic production is considered to be more environmentally sustainable due to the lack of synthetic fertilizers and pesticides.

Findings:

Qualitative Assessment:

- Organic producers perceive a bias against organic production because of lack of coverage for their production.
 - Some stakeholders acknowledged that organic production is "a different way of life" and so organic producers may not always want coverage under crop insurance.
 - Before comprehensive coverage is provided, administrators need to make sure there is a market to justify the program. It is currently very small but may grow.
-



Environmental Impact:

The lack of comprehensive organic coverage specifically targeted at these producers may discourage some producers from producing organically. This is currently a very small market and thus any impact is limited. Where numbers are justified, however, explicit provisions for organic production should be provided. The good farming practices must allow for organic production in cases where it is chosen. Individual coverages and monitoring will allow this to be accomplished more easily. There should also be an organic pricing option included if a premium on production can be demonstrated.



3.0 Crop Insurance in the Broader Policy Context

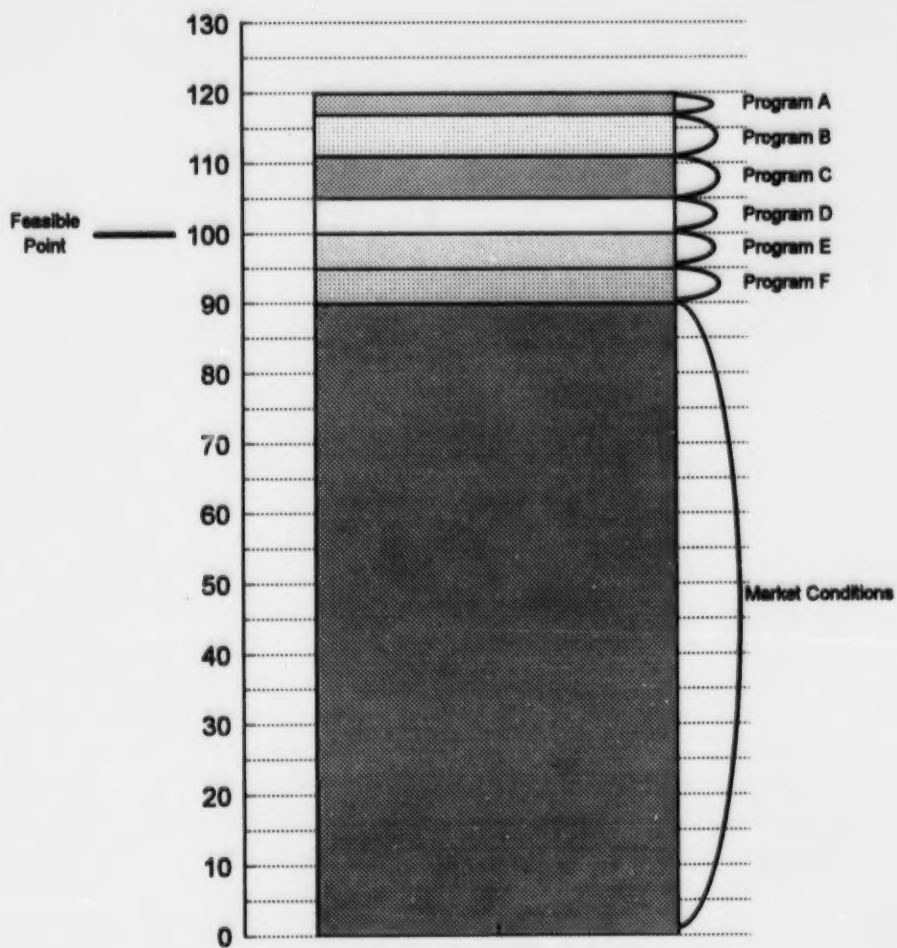
The effect of an individual agricultural policies or programs on producers' decisions can be complemented or offset by other policies or programs. The influence of individual programs or policies can be relatively small and considered unimportant on its own. The aggregate effect of many programs and policies however can be more significant. Several examples of this were raised during our consultations and can provide a clearer illustration of this concept.

In the past twenty years there has been a significant expansion of crop acreage in the prairie provinces. This has brought more of what is considered marginal land into production. This land is often more subject to erosion and was previously in some sort of permanent cover which serves as wildlife habitat. Several factors are considered to have contributed to this phenomenon to varying degrees. They include:

- increases in grain prices during the 1970's leading to an incentive to increase production;
- price stabilization programs (the current Gross Revenue Insurance Program (GRIP) and its predecessor the Agricultural Stabilization ACT (ASA)) which have reduced price risk and, therefore, may have increased incentive to produce more;
- the Canadian Wheat Board (CWB) delivery quota system was tied to acres produced and could provide an incentive to increase total acreage;
- input subsidies (such as fuel tax rebates) have reduced the costs of production and could increase the incentive to increase production. It may also affect total input use;
- in some provinces and regions there have been payments to directly assist in the clearing of new farm land;



Exhibit 2.1
Incentives in Production Decision



- the Western Grain Transportation Act (WGTA) and other transportation programs (such as purchase of rail cars or branch line rehabilitation) may have decreased the marketing costs for grain, thus increasing returns and the incentive to produce more;
- other programs such as CWB credit sales and advance payments are considered to lower costs of production and marketing and could increase the incentive to produce; and
- crop insurance reduces the yield risk associated with production on all land and could affect the incentive to produce on more acres.

This list is by no means exhaustive. It reflects both the market and policy signals sent to the producer. These signals all affect the decision of how much to produce and where to produce it. It is the cumulative effects of all the messages that makes the final decision. This can be illustrated with a simple example.

Consider a producer who needs 100 "incentive points" to produce grain on a marginal piece of land as is shown in Exhibit 2.1. The current market and policy circumstances provide 130 "incentive points" and grain is produced on that land. Results from the stakeholder consultations and the other components of this assessment suggest that the contribution by crop insurance to this total is small. If crop insurance provides 10 "incentive points" towards the total, then changing the parameters or eligibility of crop insurance (or many other individual programs) will not change the overall outcome. There may be decreased incentive to produce on that piece of land but the threshold is still achieved.

It is also important to acknowledge that individual policies or programs can create "incentive points" to remove a piece of land from production. There are several examples of this sort of program. They include:



- the Permanent Cover Program (PCP) offered by the Prairie Farm Rehabilitation Administration (PFRA) which offers long term incentives to remove sensitive land from annual grain production into permanent cover;
- the Land Rental Program offered by Ducks Unlimited which enters into long term rental agreements with producers who remove land from annual production and create suitable habitat; and
- conservation agreements that provide extension and research functions to improve soil conservation in Canada.

In some cases these are providing sufficient "incentive points" to go back below the 100 point threshold. It is by changing that incentive threshold or by changing the value of that total incentive to cross the threshold that the environmental objectives are achieved.

Addressing the impacts of policies individually may show only many small impacts. The accumulation of all these affects are the potential source of the problem and this may be lost in individual assessments. These individual assessments need to be a part of a comprehensive strategy of impact assessment in order to be credible and provide an accurate and complete picture.



4.0 Recommendations

The environmental issues profiles suggest that there is little or no environmental impact directly attributable to crop insurance. There are, nonetheless, a number of areas that have been identified as problems or opportunities. The following recommendations outline our proposals for overcoming the potential problems or exploiting the opportunities within the crop insurance program in order to ensure the ongoing environmental sustainability of the program.

4.1 Good Farming Practices

The identification of good farming practices provides the best lever for ensuring that crop insurance does not contribute to environmentally harmful practices. In fact, the good farming provisions could also provide an opportunity to build in disincentives for harmful practices. For example, while crop insurance may not provide the incentive to produce annual crops on marginal land, it also provides no clear disincentive. If coverage was not provided on land considered marginal, either Class 4 and 5 or another set of criteria, producers would have a disincentive to farm that marginal land. A stronger approach would involve loss of all coverage for producers who crop marginal land. Specific issues that would lend themselves to this approach would include:

- Environmentally sensitive land. Marginal lands could be identified and made ineligible for coverage if brought into annual crop production. Similarly, marginal lands currently in production could be phased out for coverage for specific crops over time. This land may be currently eligible for coverage but should, in fact, be returned to forage or other permanent cover.
- Habitat preservation. Wetlands, woodlands, and other habitats could be identified and made ineligible for insurance if brought into production.
- Erosion control. Selected erosion control practices could be encouraged/required.



What constitutes 'good farming practices' in terms of environmental sustainability must be clearly defined and formally incorporated into the field level operations of the crop insurance program in every province. This means specific practices with respect to the four factors: choice of land; choice of crop; inputs used; tillage/cultivation methods, must be defined. These practices must be viewed in terms of both short and long term environmental stability and insurance viability. To a large degree these two factors will be complementary. In fact, it is unlikely the definition of good farming practices will change significantly. Rather they will be more formally defined and environmental sustainability will be explicitly incorporated into the process of establishing acceptable practices. In other words, if certain environmentally sound practices increase the probability of a crop loss and program payment, this should be factored into the program. This must be done in such a way as to ensure actuarial soundness, yet still maintain program attractiveness. It must be recognized that since crop insurance is not a mandatory program, its potential to affect the environment positively is limited by the willingness of producers to participate in the program. Several options could be considered:

- Clearly define and articulate the expectations of producers enrolled in the program with respect to good farming practices. This will require strong leadership because of the less than perfect certainty of the science. Regardless, decisions and policies should be established.
- Incentives in the form of reduced premiums or increased coverage for 'very good practices' could be provided. While it is probably technically easier to provide disincentives for poor practices, it is likely less saleable in a voluntary program.



Because the science of environmental sustainability with respect to agriculture is a evolving science it is absolutely necessary that any provisions with respect to good farming practices be reviewed and updated routinely to reflect the latest in developments. While it is necessary to recognize and acknowledge regional differences across the country, this approach also provides an opportunity to establish minimum acceptable guidelines for crop insurance on a national level. Clearly defined, formal provisions should be incorporated into the federal provincial agreements in order to establish national standards.

These good farming practices need not be narrowly prescriptive or onerous. They should only define broad parameters of acceptable behaviour or exclude some especially bad practices. These good farming practices are intended to provide guidelines.

In order for this approach to be effective, monitoring of conformity of the good farming practices must take place. Producers must be held accountable for unacceptable behaviour in years where no claim is made in order for environmental sustainability objectives of good farming practices to be effective.

4.2 Individual Coverage

Complete individual coverage based insurance should be adopted as quickly as possible. Individual underwriting of insurance should also be adopted as quickly as possible. Individual based coverage further ensures that incentives for producers to undertake practices which will be harmful to the sustainability of their operation in the long run are removed. The incorporation of individual coverages also requires careful monitoring of the specific practices undertaken on each farm as coverage will be based on what is "normal" for that operation. This will complement the more formal definition of environmentally sustainable good farming practices as well.



Producers will be able to undertake practices such as low input agriculture and receive coverage geared specifically to the level of risk faced by the producer with his or her specific practices.

There would also be some merit in developing farm based coverages for forages. This would remove a degree of the bias against forages in crop insurance. Producers perceive less risk reduction based on the area of forage coverage.

4.3 Organic

There should be attempts where ever possible to improve the provisions for organic production coverage. While we recognize that the call for this type of coverage is still very limited, it does represent a form of alternative production methods that the program should be supportive of.

4.4 Wildlife and Waterfowl Coverage

Wildlife issues are particularly difficult to address because individual producers may have very limited control of effects on their own farming operations. If it is a general broadly based societal choice to encourage the success of wildlife by the maintenance of their habitats, then a high level of coverage for the damage caused by them is probably only fair. More specifically, if as suggested above that insurance coverage should be removed or discouraged for marginal lands and wetlands, some of which could be wildlife habitats and waterfowl, then it would be logical in a broad policy perspective to couple this with greater coverage provisions for wildlife losses.



4.5 Testing of New or Altered Provisions

All new provisions or significant alterations to the existing provisions of the crop insurance program should be tested for environmental soundness before being adopted. The analytical approach used in this assessment should provide an excellent base for doing so. We would recommend a two step process. First a qualitative analysis of the alteration would be done by answering the following question:

Does the alteration in program provisions change the absolute or relative level of benefit provided so as to influence negatively the choice of land, choice of crop, inputs used or tillage/cultivation methods used?

If the response is yes to any of the four factors then a further quantitative analysis should be undertaken using one or more of the quantitative models developed for this assessment. (This will require the maintenance or update of the models as necessary.) If the quantitative analysis reveals a negative impact on the environmental decisions made by producers than the provisions should be revised or altered to mitigate the impact and the process repeated.

The process should be undertaken by a panel composed of crop insurance representatives, producers, and environmental specialists.

4.6 Requirements for Ongoing Monitoring

The incorporation of environmental sustainability objectives into the policy context is a relatively new phenomenon. The assessment of the environmental impact of programs is in its infancy but is an ongoing requirement. In order to streamline and improve the process of environmental assessment of programs, there is an opportunity to identify selected data or indicators to monitor changes and



provide more detailed input into the impact of programs on producer decisions. Candidates for ongoing monitoring include:

- A formal definition of "marginal" or "environmentally sensitive land." Once this has been formally identified and inventoried, the proportion of this land insured versus all other lands can be tracked. Similarly, the proportion of new breaking insured could also be tracked.
- A formal definition of habitat. This is important for a producers to be aware of what habitat is. It is also important to inventory habitat so that changes and trends can be tracked and coverage of cropped habitat can be monitored.
- Input use on insured and uninsured land. General trends in input use are interesting but real indicators of differences on program and non program land would provide greater insight.
- Which crops are farmers insuring and not insuring? This provides insight into differences between crops on farms and between farms.
- Compliance with good farming practices on non claim insured acres. It is important to know how effective the guidelines are on an ongoing basis.
- Length of potato rotations on insured and uninsured land.
- Differences in practices on insured and uninsured lands.

It is important to establish priority areas. While some of the information and data may exist and require identification and collation, most will be new and need to be collected. This is not an inexpensive undertaking and resources will have to be focused in priority areas. The burden need not be borne solely by the crop insurance program. Crop insurance is only one of the programs with the potential to affect producer practices and thus sustainability and, therefore, shouldn't bear the burden responsibility for all of the required environmental monitoring. Many of the characteristics



outlined above provide general benchmarks of changes which could be attributable to other programs or other factor. A comprehensive initiative to coordinate the monitoring of priority trends and indicators with input from several program areas would be the most effective approach to this area.

4.7 Comprehensive Approach

Finally, but most importantly, **we strongly urge the development of a framework for reviewing the environmental impact of agricultural policies in a comprehensive manner.** While it is important to initially review each program in isolation to ensure that there are no negative environmental influences specifically attributable to that program, the comprehensive review is equally important.

As described in chapter 3 individual program analysis runs the risk of missing the significance of the additive impact of multiple programs. While each individual program may have only minor affects on the environment, together the impact could be large. A framework should be developed which has the capability and flexibility to look at the whole package of policies (federal and provincial) affecting an individual producer in each province. Only through this type of framework can the real environmental impact of agricultural policy be assessed.

